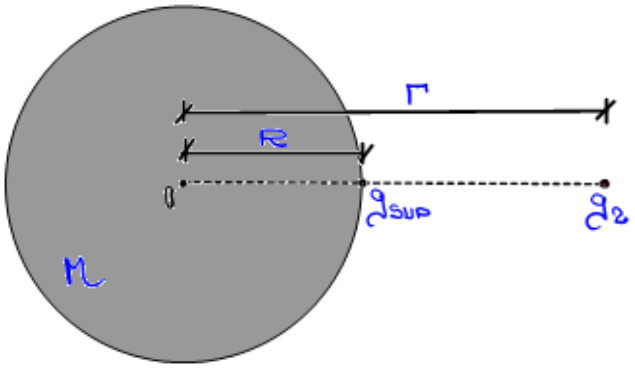


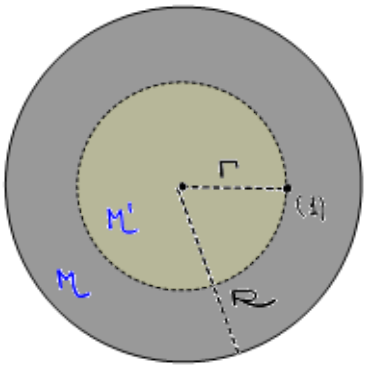
$$g_2 = \frac{GM}{r^2}$$

módulo de la aceleración de la gravedad para puntos fuera de la superficie del planeta

$$g_{SUP} = \frac{GM}{R^2}$$

módulo de la aceleración de la gravedad para puntos muy cercanos a la superficie del planeta.

Para puntos dentro del planeta.



$$g_1 = \frac{GM'}{r^2} \quad \dots (I)$$

Consideramos un planeta con densidad constante.

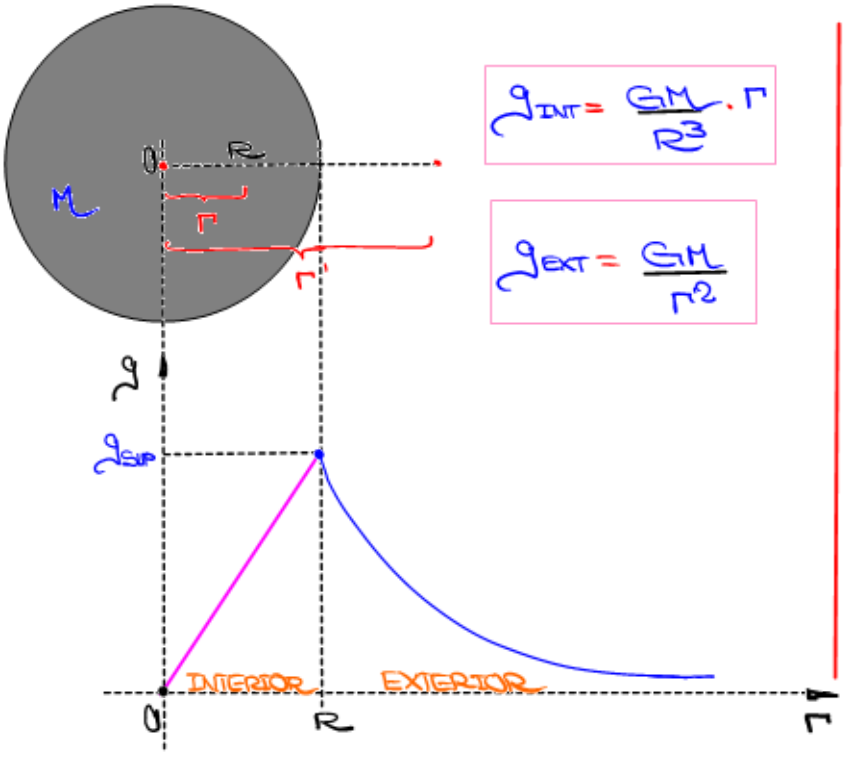
$$\frac{M'}{\frac{4\pi r^3}{3}} = \frac{M}{\frac{4\pi R^3}{3}}$$

$$\therefore M' = \frac{M r^3}{R^3}$$

En (I)

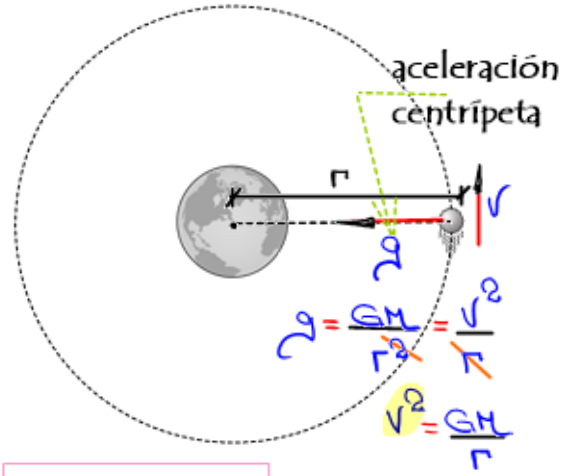
$$g_1 = \frac{G\left(\frac{M r^3}{R^3}\right)}{r^2}$$

$$g_1 = \frac{GM}{R^3} \cdot r$$



$$g_{INT} = \frac{GM}{R^3} \cdot r$$

$$g_{EXT} = \frac{GM}{r^2}$$



$$g = \frac{GM}{r^2} = \frac{V^2}{r}$$

$$V^2 = \frac{GM}{r}$$

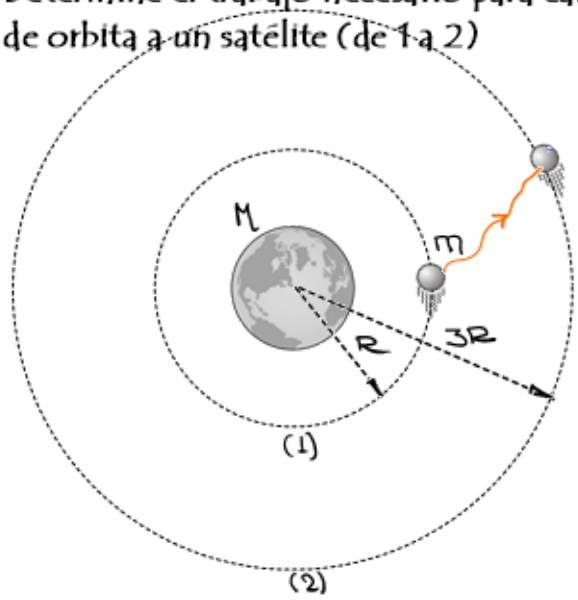
$$E_M = E_C + E_{PG}$$

$$E_M = \frac{mV^2}{2} - \frac{GMm}{r} = \frac{mGM}{2r} - \frac{GMm}{r}$$

$$\therefore E_M = -\frac{GMm}{2r}$$

energía mecánica para un satétile en orbita alrededor de un planeta

Determine el trabajo necesario para cambiar de orbita a un satélite (de 1 a 2)



$$W_{FNC} = E_{Mf} - E_{M_0}$$

$$W_{FNC} = \left(-\frac{GMm}{2 \times 3R}\right) - \left(-\frac{GMm}{2 \times R}\right)$$

$$\therefore W_{FNC} = \frac{GMm}{3R}$$